

## Activity 5 Structural Geology and Your Community

### Think About It

Page U39

Date

Page #

- What would happen if you tried to use a powerful machine to fold a marble bench?
- How are rocks able to fold naturally without first breaking?



# WHAT DO YOU THINK?

## Activity 5

### **Investigate Part A**

Page U40

Date

Page #

---

4a. In your notebook sketch what the folds in your block look like on the faces of each of the cuts you made.

## Activity 5

### Investigate Part B

Page U41

Date

Page #

---

2a. Draw a side and top view of what happens. Use arrows to show the direction of force, and label the hanging wall and footwall.

3a. Draw a side view and a top view of what happens. Use arrows to show the direction of force, and label the hanging wall and footwall.

3b. What is the difference in the way the pieces moved in 2a and 3a?

4a. Draw a side view and a top view of what happens. Use arrows to show the direction of force.

## Activity 5

### Digging Deeper

Pages U43-47

Date

Page #

**Learning Objectives:** In writing, SWBAT describe and model the forces that act on rocks, using academic language.

Tilting

is a sign that rocks have been deformed by forces acting within the Earth



**Fault**

a break or crack in rock

Rocks move along either side of the fault

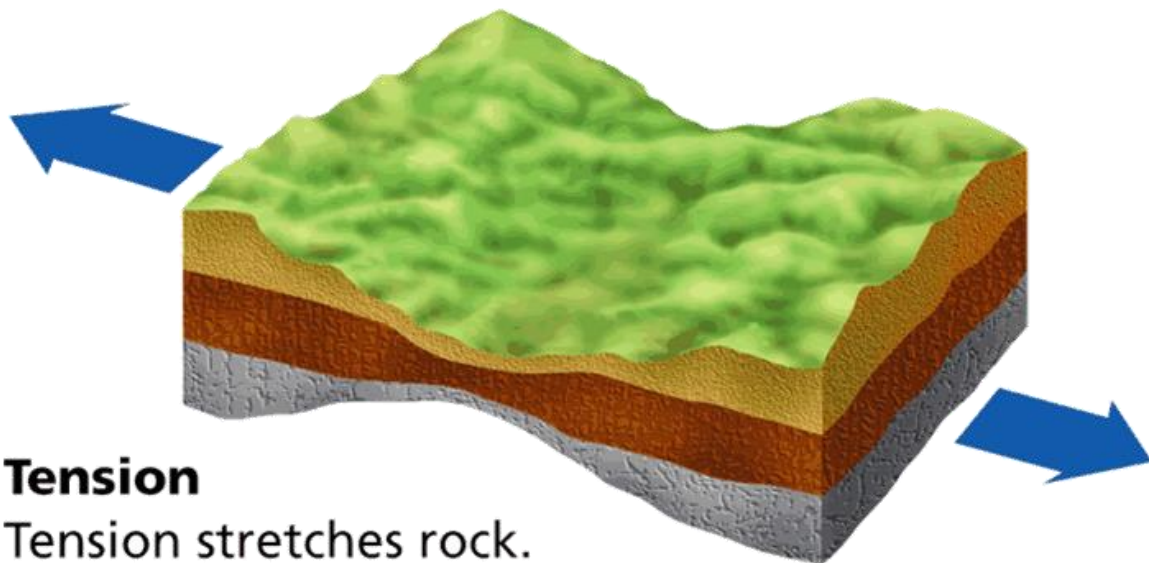


3 types of forces

1. tension forces
2. compression forces
3. shear forces

### Tension force

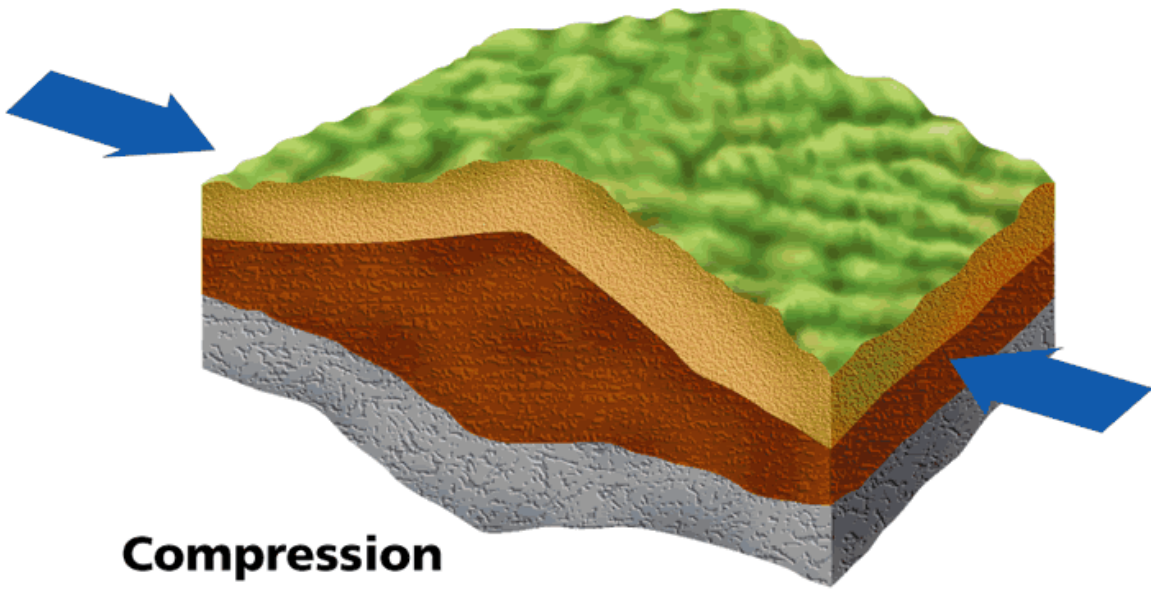
a force that pulls material apart



### Compression force

a force that pushes material together

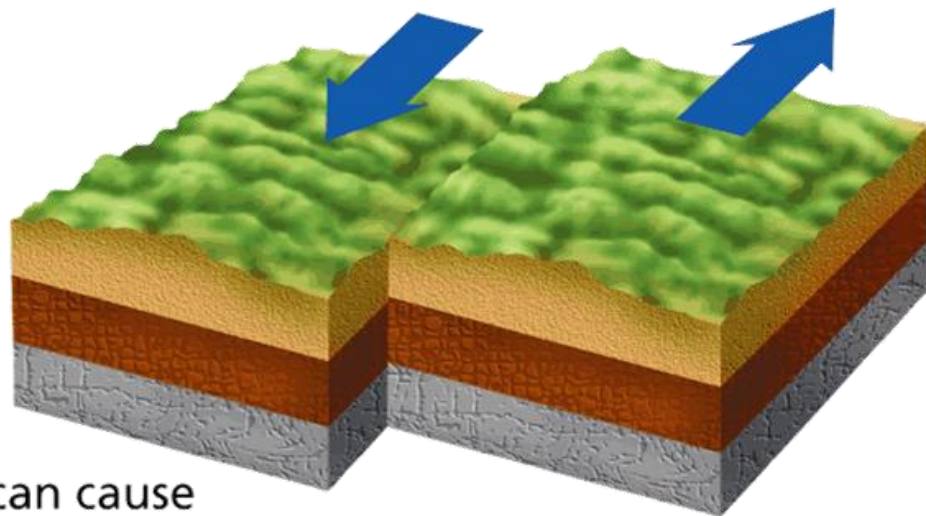


**Compression**

Compression pushes rock together.

**Shear force**

a force that pushes rock in opposite horizontal directions

**Shearing**

Shearing can cause masses of rock to slip.

**Learning Objective:** In writing, SWBAT detail the factors that cause a rock to fault or fold, using academic language.

Temperature and time

determine whether a rock is folded or faulted

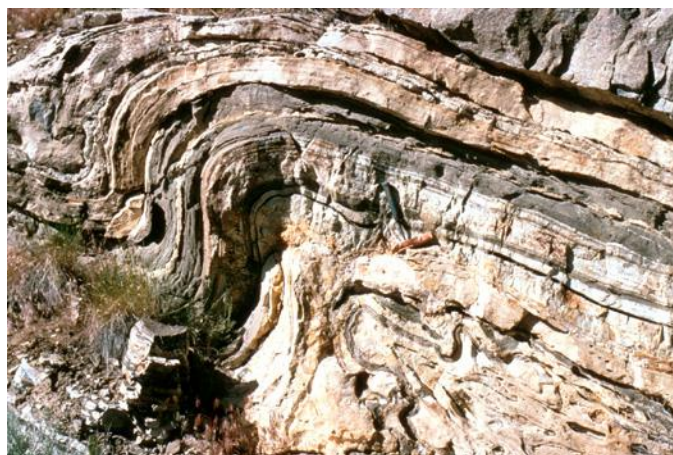
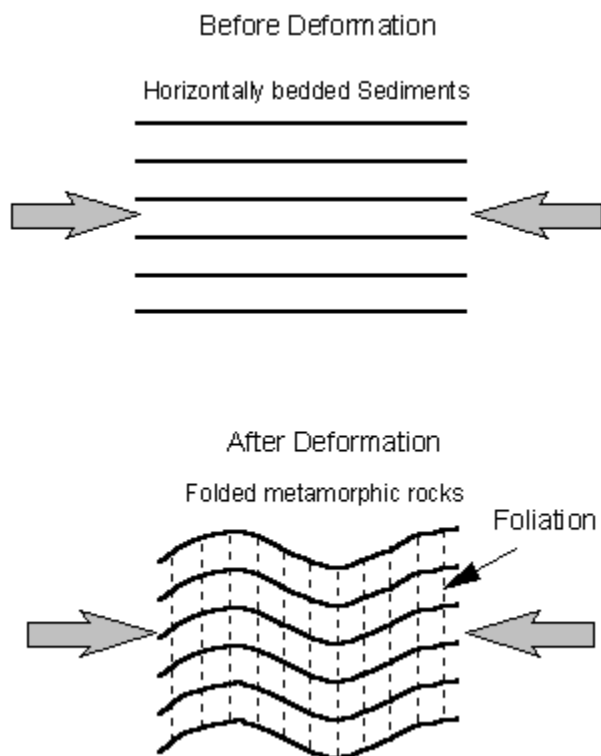
Low temperatures

rocks are brittle and break

High temperatures

the rocks constantly change their shape by folding

Folding is an example of how rocks can change their shape continuously without breaking



If forces build up very fast

rocks are likely break

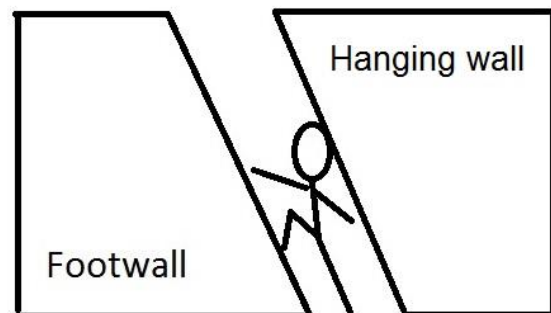
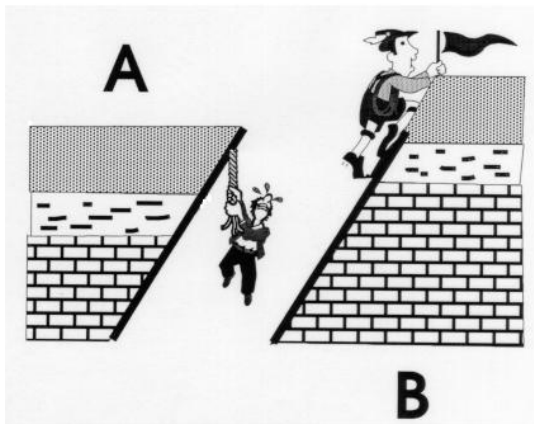
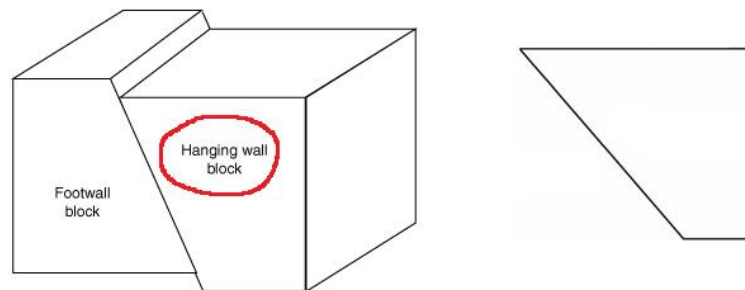
If forces build up very slowly

rocks are more likely to fold

**Learning Objective:** In writing, SWBAT describe the relationship between fault movements and the forces that cause them using academic language.

Hanging wall

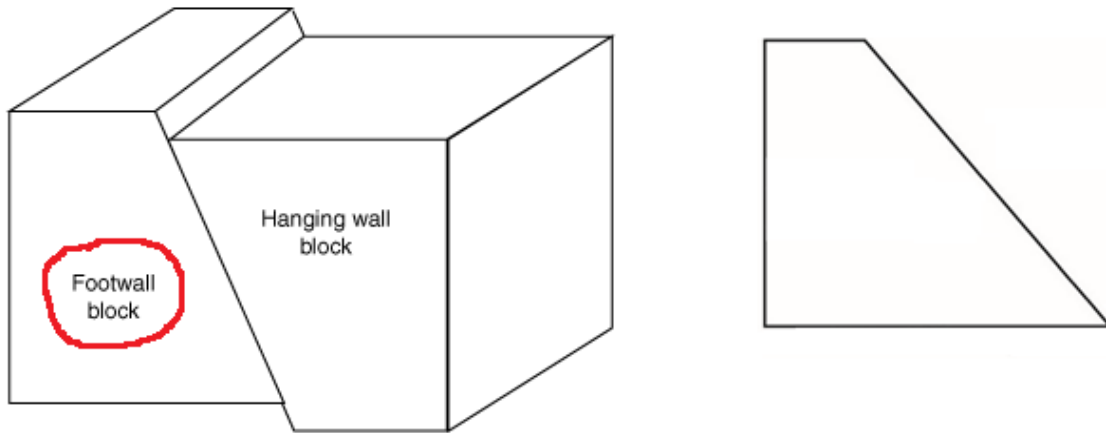
the mass of rock that lies above the fault





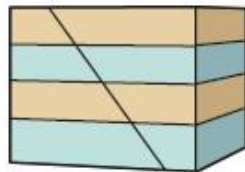
Footwall

the mass of rock that lies below the fault

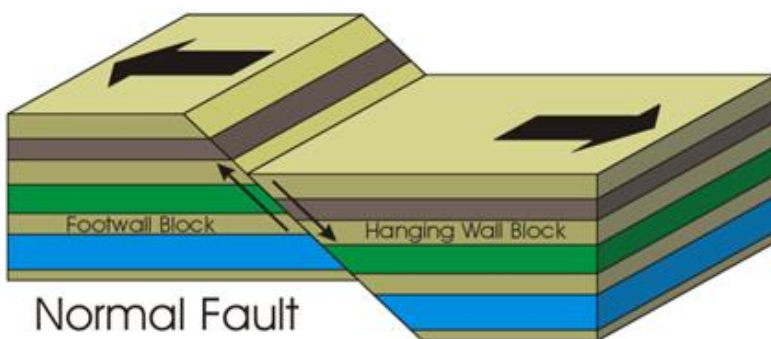
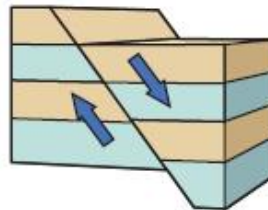


## Normal fault

a fault formed by **tension forces** that causes the **hanging wall to move down** compared to the footwall



(a) normal fault



Normal faults form along divergent boundaries, where tectonic plates move away from each other

Example: Great Rift Valley

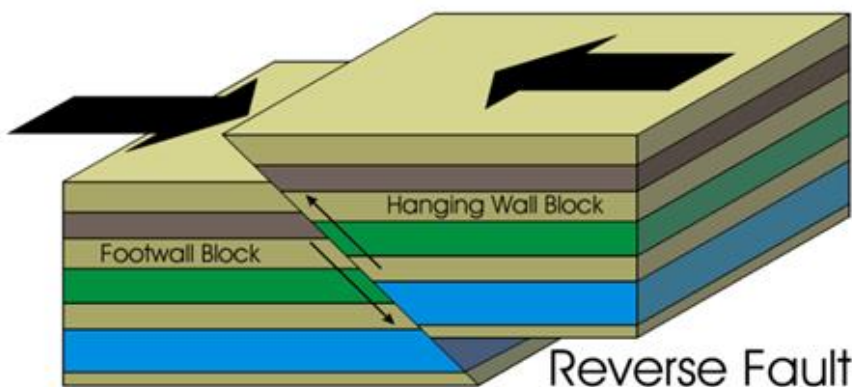
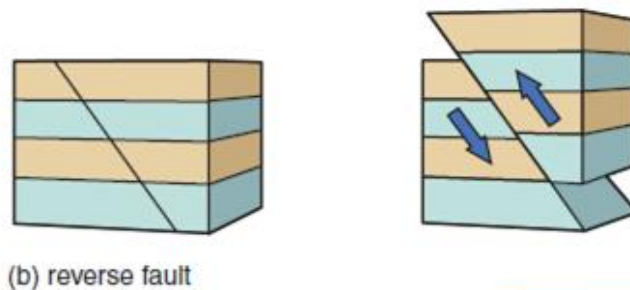
<http://www.absorblearning.com/media/attachment.action?quick=13d&att=2823>

[http://www.classzone.com/books/earth\\_science/terc/content/visualizations/es1103/es1103page01.cfm](http://www.classzone.com/books/earth_science/terc/content/visualizations/es1103/es1103page01.cfm)

<http://www.iris.washington.edu/gifs/animations/faults.htm>

### Reverse fault

a fault formed by **compression forces** that cause the **hanging wall move up** compared to the foot wall



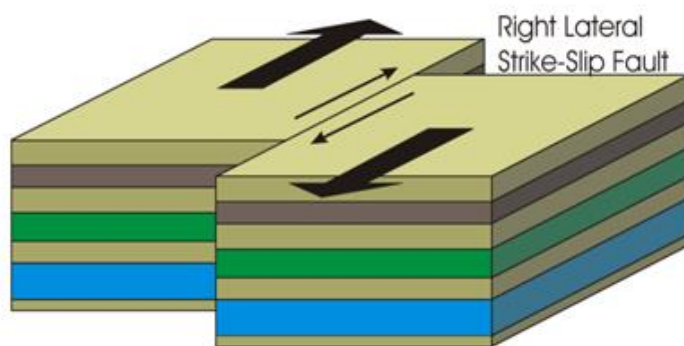
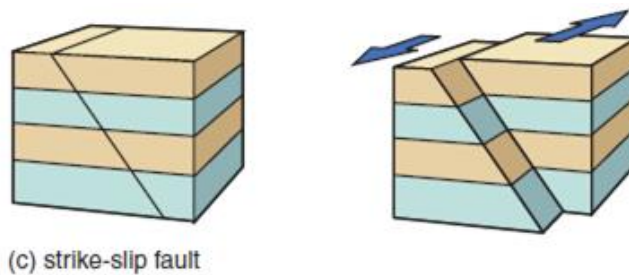
Reverse faults usually occur at convergent boundaries, where plates move towards each other

Example: Rocky Mountains

<http://www.absorblearning.com/media/item.action?quick=13e>

### Strike-slip fault

a fault formed by **horizontal shear forces** that cause rocks to **slide past each other**



Strike-slip faults usually form at transform boundaries, where plates are moving past each other

## Example: San Andreas Fault

[http://www.wwnorton.com/college/geo/animations/types\\_of\\_faults.htm](http://www.wwnorton.com/college/geo/animations/types_of_faults.htm)

[http://www.classzone.com/books/earth\\_science/terc/content/visualizations/es1103/es1103page01.cfm](http://www.classzone.com/books/earth_science/terc/content/visualizations/es1103/es1103page01.cfm)

**Learning Objective:**    **In writing, SWBAT differentiate between a syncline and an anticline using academic language in order to understand how rock change.**

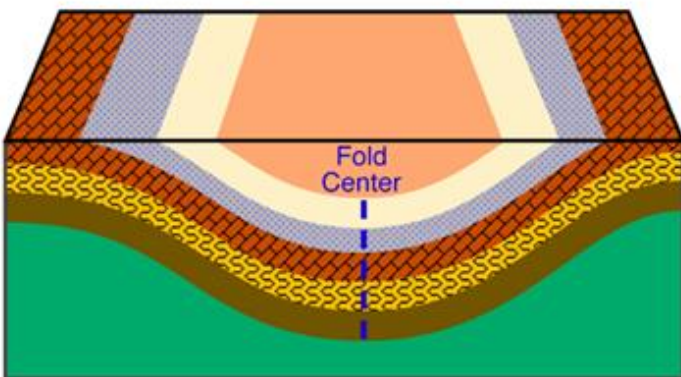
### **Fold**

a bend in rocks

Folds form when rocks are squeezed together by compression forces

### **Syncline**

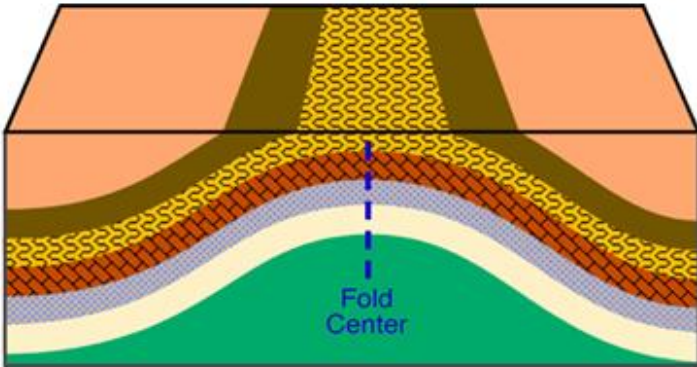
the part of the fold in rock that curves downward





## Anticline

the part of the fold in rock that  
curves upward





## Activity 5

### Check Your Understanding

Date

Page U47

Page #

---

1. Describe **AND** diagram tension, compression and shear forces.

2. What factors determine whether a rock will fault or fold? Explain your answer.

3. Why do scientists work with models to understand folding and faulting?

## Activity 5

### Understanding and Applying

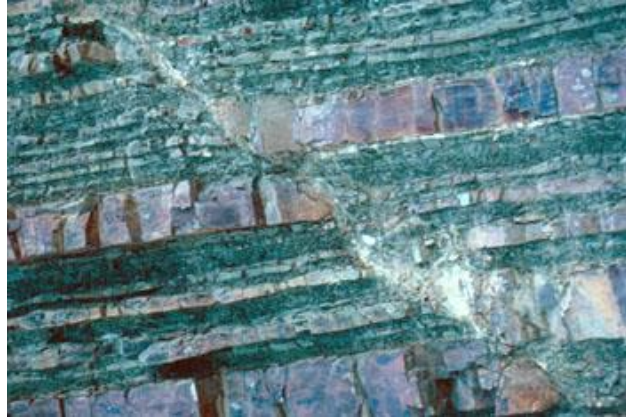
Page U47

Date

Page #

---

1a. Do the rocks appear to have been pulled apart, pushed together, or slid past each other to form this structure? Explain.



1b. What type of fault is this?

2a. Were the rocks pulled apart, pushed together, or slid past each other to form this structure? Explain.



2b. What type of fault is this?